

WHAT IS CLAIMED IS:

1. An abrasion and wear resistant fabric assembly comprising:

a flexible substrate having a top surface; and  
a plurality of non-overlapping plates affixed to  
the top surface of the substrate, wherein  
the plates have a substantially uniform  
thickness of approximately 5 to 20 mils.

2. The abrasion and wear resistant fabric of claim 1,  
wherein the substantially uniform thickness is  
approximately 5 to 10 mils.

3 The abrasion and wear resistant fabric assembly  
of claim 1, wherein the plates define a plurality of  
continuous gaps between adjacent plates, each gap  
having a width approximately 5 to 20 mils.

4. The fabric assembly of claim 3, wherein the  
plates each have a maximum dimension in the range of  
20 to 200 mils.

5. The fabric assembly of claim 3, wherein the  
plates are identical.

6. The fabric assembly of claim 3, wherein the  
plates each have a diameter in the range of 20 to 100  
mils.

7. The fabric assembly of claim 5, wherein the plates are shaped as a polygon.

8. The fabric assembly of claim 7, wherein the polygon is an equilateral hexagon.

9. The fabric assembly of claim 8, wherein the equilateral hexagon has a diameter in the range of 20 to 100 mils.

10. The fabric assembly of claim 9, wherein the diameter is in the range of 20 to 80 mils.

11. The fabric assembly of claim 5, wherein the plates have a curved shape.

12. The fabric assembly of claim 11, wherein the curved shape is approximately circular.

13. The fabric assembly of claim 3, wherein the plates are non-identical relative to each other.

14. The fabric assembly of claim 3, wherein the plates comprise a polymeric resin.

15. The fabric assembly of claim 14, wherein the polymeric resin is epoxy.

16. The fabric assembly of claim 3, wherein the plates comprise a composite material.

17. The fabric assembly of claim 16, wherein the composite material comprises a ceramic material.

18. The fabric assembly of claim 16, wherein the composite material comprises a plastic.

19. The fabric assembly of claim 3, wherein the flexible substrate comprises a woven or knit fabric.

20. The fabric assembly of claim 19, wherein the flexible substrate comprises polyester.

21. The fabric assembly of claim 19, wherein the flexible substrate comprises cotton.

22. The fabric assembly of claim 19, wherein the flexible substrate comprises Kevlar®.

23. The fabric assembly of claim 19, wherein the flexible substrate comprises nylon.

24. The fabric assembly of claim 3, wherein the flexible substrate comprises a non-woven material.

25. The fabric assembly of claim 24, wherein the non-woven material comprises leather.

26. The fabric assembly of claim 3, wherein the substrate comprises a compressible material.

27. The fabric assembly of claim 26, wherein the substrate further comprises a fabric laminated to the compressible material.

28. The fabric assembly of claim 3, wherein the flexible substrate comprises neoprene.

29. An abrasion and wear resistant fabric assembly comprising:

- a flexible substrate having a top surface; and
- a plurality of non-overlapping plates affixed to the top surface of the substrate, the plurality of plates arrayed such that a plurality of gaps are defined between adjacent plates, wherein the plates have a substantially uniform thickness, and wherein the plurality of plates enhances the abrasion resistance of the flexible substrate by a selected factor.

30. The abrasion and wear resistant fabric assembly of claim 29, wherein the plurality of plates comprises a material that selectively increases heat resistance of the flexible substrate.

31. The fabric assembly of claim 29, wherein the plate thickness is approximately 5 to 40 mils.

32. The fabric assembly of claim 29, wherein the plates comprise polymeric resin with tensile strength greater than 100 kgf/cm<sup>2</sup>.

33. The fabric assembly of claim 29, wherein the factor ranges from 2 to 200.

34. The fabric assembly of claim 33, wherein the factor of abrasion resistance enhancement ranges from 5 to 100.

35. The fabric assembly of claim 34, wherein the factor of abrasion resistance enhancement ranges from 10 to 50.

36. The fabric assembly of claim 35, wherein the factor of abrasion resistance enhancement ranges from 12 to 30.

37. A method of making an abrasion and wear resistant fabric assembly comprising:

selecting a flexible substrate having a top surface;

selecting a heat resistant plate material capable of being solid and affixed to the top surface of the flexible substrate; and

affixing the plate material on the top surface of the flexible substrate, the plate material forming a plurality of non-overlapping plates having a substantially uniform thickness of approximately 5 to 40 mils.

38. A method of making an abrasion and wear resistant fabric assembly comprising:

selecting a flexible substrate having a top surface;

selecting a plate material capable of being solid and affixed to the top surface of the flexible substrate; and

affixing the plate material on the top surface of the flexible substrate, the plate material forming a plurality of non-overlapping plates having an approximate uniform thickness in the range of 5 to 40 mils, the plates enhancing the abrasion resistance of the flexible substrate by a selected factor.

39. An fabric assembly comprising:

a flexible substrate having a top surface;  
and

a plurality of non-overlapping plates affixed  
to the top surface of the substrate, wherein the  
plates comprise a low thermal conductivity  
material.

40. The fabric assembly of claim 39, wherein the low  
thermal conductivity material comprises porous ceramic.

41. The fabric assembly of claim 40, wherein the low  
thermal conductivity material further comprises silica  
glass fiber.

42. The fabric assembly of claim 41, wherein the low  
thermal conductivity material comprises an air volume  
of up to approximately 94%.

43. The fabric assembly of claim 42, wherein the  
substrate comprises a heat resistant fabric.